




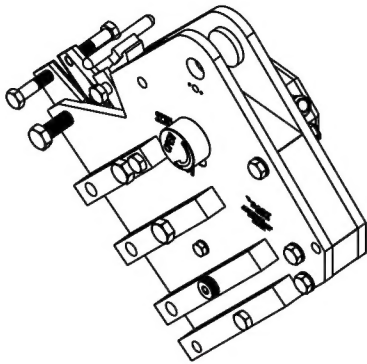
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SEE ATTACHED DEVIATION

ASSY QTY	ASSY QTY	B/O	Part #	UNIT QTY	Description	Material	B/O INFORMATION OR SPECIFICATIONS
		B/O	C2-3-2-1	2	RETAINING RING 	STEEL	Ø5/16 (KAMAN #1400-0031)
		B/O	C2-14-2	2	LABEL RIVETS	18-8 S.S.	NO 4 (MCMMASTER-CARR #91654A106)
			C10-9-1	1	LATCH	4140/4142	
		B/O	C10-9-2	1	LATCH BEARING		(TORRINGTON #6NBC914YZP)
			C10-9-5	1	LATCH SHAFT	4140/4142	
		B/O	C10-41	1	STRAIN RELIEF CONNECTOR	BRASS	1/2 TRADE SIZE (MCMMASTER-CARR #6907K14)
			20NR-02	1	SOLENOID COVER	ALUMINUM	
			20NR-04	1	SOLENOID ASSEMBLY		
		B/O	20NR-05	1	SOLENOID LOCATING PIN	S.S.	Ø1/4 X 3/8 (MCMMASTER-CARR #90145A536)
		B/O	20NR-06	1	SOLENOID LOCATING PIN	S.S.	Ø3/16 X 3/8 (MCMMASTER-CARR #90145A503)
			20NR-08	1	LIFTING BUSHING	4140/4142	
			20NR-09	1	SIDE PLATE - SOLENOID	4140/4142	
			20NR-10	1	SPACER	6061	
			20NR-11-1	2	STEP PIN	4140/4142	
		B/O	20NR-11-2	2	STEP PIN E-CLIP	S.S.	Ø3/16 (MCMMASTER-CARR #98408A126)
		B/O	20NR-13	2	RAIL BOLT	STEEL	5/8-18 X 2-1/4 (MCMMASTER-CARR #92620A592)
			20NR-14	2	LOAD RAIL	4140/4142	
		B/O	20NR-15	2	PLATE BUSHING	STEEL	O.D. Ø1-1/8 X I.D. Ø17/32 (MCMMASTER-CARR #98029A033)
			20NR-16	1	LOAD STOP	4140/4142	
			20NR-17	1	LOAD STOP BUSHING	STEEL	Ø7/8 O.D X 1-5/8 (MCMMASTER-CARR #8491A747) MODIFIED
		B/O	20NR-19	1	ACTUATOR PIN SHORT	S.S.	Ø1/4 X 1-1/2 (MCMMASTER-CARR #97855A630)
		B/O	20NR-20	1	ACTUATOR PIN LONG	S.S.	Ø1/4 X 2 (MCMMASTER-CARR #92383A754)
			20NR-21	1	ACTUATOR SHAFT	4140/4142	
		B/O	20NR-22	1	ACTUATOR WASHER	STEEL	Ø5/8 (MCMMASTER-CARR #95229A610)
			20NR-23	1	RUBBER PAD SOLENOID BACKING	RUBBER	(MCMMASTER-CARR #8609K48) MODIFIED
		B/O	20NR-24	2	LATCH RETURN SPRING	STEEL	Ø.25 OD X Ø.023 WIRE (MCMMASTER-CARR #9654K519)
			20NR-26	1	ROUND BUMPER	POLYURETHANE	
		B/O	20NR-27	2	SPRING HOLDER PIN	S.S.	Ø3/16 X 1-1/2 (MCMMASTER-CARR #90145A514)
		B/O	20NR-28	1	KEEPER BOLT	STEEL	1/2-20 X 3 (MCMMASTER-CARR #91257A751)
			20NR-29	2	LATCH PIN BUSHING	4140/4142	
		B/O	20NR-33	1	LOCK WASHER KEEPER	S.S.	Ø1/4 (MCMMASTER-CARR #90900A030)
		B/O	20NR-34	1	KEEPER HANDLE SCREW	STEEL	1/4-20 X 1-1/4 (MCMMASTER-CARR #91253A544)
			20NR-35	1	KEEPER HANDLE	A-36	
			20NR-36	1	KEEPER HANDLE BLOCK	6061	
			20NR-37	1	KEEPER	4140/4142	
		B/O	20NR-38	1	KEEPER BUSHING	STEEL	Ø3/4 X 1 (MCMMASTER-CARR #8491A462)
		B/O	20NR-39	1	KEEPER SPRING	STEEL	Ø.375 OD X Ø.035 WIRE (MCMMASTER-CARR #9654K193)
			20NR-40	1	UPPER RAIL	A-36	
			20NR-41	1	MANUAL RELEASE KNOB	6061	
			20NR-43	1	SIDE PLATE - COVER	4140/4142	
			20NR-44	2	STIFFENER - 3 HOLE	4140/4142	
		B/O	20NR-45	5	NYLOCK NUT	STEEL	1/2-20 (MCMMASTER-CARR #97135A255)
		B/O	20NR-46	1	5/8 NUT	STEEL	5/8-18 (MCMMASTER-CARR #97135A275)
		B/O	20NR-47	1	SHOULDER BOLT	STEEL	1/2-13 X Ø5/8 X 4-1/2 (MCMMASTER-CARR #91259A812)
			20NR-49	2	STIFFENER - 2 HOLE	4140/4142	
			20NR-50	2	STIFFENER - OFFSET HOLES	4140/4142	
		B/O	20NR-51	1	NUT FOR SHOULDER BOLT	STEEL	1/2-13 (MCMMASTER-CARR #97135A250)
		B/O	20NR-53	3	BOLT	STEEL	1/2-20 X 3-1/4 (MCMMASTER-CARR #91257A745)
			20NR-54	1	LOCK BEARING PIN	4140/4142	
			20NR-56	1	SPRING ANCHOR	STEEL	8-32 X 7/8 (MCMMASTER-CARR #9634K22) MODIFIED
		B/O	20NR-57	2	CIRCLIP (LOCK ROLLER PIN)	STEEL	Ø3/8 (MCMMASTER-CARR #97633A170)
			20NR-58	1	LOCK ROLLER PIN	4140/4142	
		B/O	20NR-59	2	PLATE BUSHING	STEEL	O.D. Ø1-3/8 X I.D. Ø21/32 (MCMMASTER-CARR #98029A035)
		B/O	20NR-60	1	LOCK BUSHING	STEEL	Ø3/4 X 1-1/2 (MCMMASTER-CARR #8491A738)
			20NR-61	1	LOCK	4140/4142	
			20NR-62	1	LOCK ROLLER	4140/4142	
		B/O	20NR-63	1	BEARING LOCK		Ø1 X 5/8 (MCGILL #CYR-1-S)
			20NR-64	3	FLAT BUMPER	POLYURETHANE	
		B/O	20NR-65	1	BACK SPACER BUMPER PIN	S.S.	Ø1/8 X 1-1/2 (MCMMASTER-CARR #90145A884)


REVISIONS					
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED
1		AS DRAWN BY CANAM.	8/1/2013	CFS	
2	15-0165	UPDATED TO NEW DRAFTING STANDARDS. 20NR-01 REPLACED W/ AN4-23A. 20NR-25 REPLACED W/ 188-FPSS-1032-1/4. 20NR-42 REPLACED W/ 188-FPSS-1/4 20-3/8. 20NR-52-3 REPLACED W/ AN960-616. 20NR-53 CH'D B/O WAS 1/2-20 X 3 #91257A751 IS 1/2-20 X 3-1/4 #91257A745. 20NR-55 REPLACED W/ C2-3-2-1. 20NR-30 REPLACED W/ C10-9-1. 20NR-31 REPLACED W/ C10-9-2. 20NR-32 REPLACED W/ C10-9-5. 20NR-52-1 REPLACED W/ AN6-27A. 20NR-52-2 REPLACED W/ MS21044N6. 20NR-91 REPLACED W/ 600.1309. 20NR-92 REPLACED W/ C2-14-2. 20NR-110 REPLACED W/ MS21083N4. 20NR-111 REPLACED W/ AN960-416L. 20NR-114 REPLACED W/ AN960-816. 20NR-115 REPLACED W/ C10-41. 32446 REPLACED W/ 32448. 20NR-113 REPLACED W/ 600.1325. ADDED P/N 600.1309-A. ADDED REBUILD NOTES. ADDED ENGRAVING NOTE AND DETAIL.	7/21/2015	DPD	JAG

ASSY QTY	ASSY QTY	B/O	Part #	UNIT QTY	Description	Material	B/O INFORMATION OR SPECIFICATIONS
			20NR-66	1	SIDE RAIL	1018/1020	
		B/O	20NR-67	1	LOAD STOP RETURN SPRING	STEEL	Ø.375 OD X Ø.035 WIRE (MCMMASTER-CARR #9654K916)
		B/O	20NR-68	1	LIGHT RELEASE SPRING	STEEL	Ø.028 WIRE X 3-1/8 DENDOFF
		B/O	20NR-69	1	LIGHT RELEASE PIVOT SHAFT	S.S.	Ø1/4 X 1-1/2 (MCMMASTER-CARR #90145A546)
			20NR-70	1	LIGHT RELEASE LEVER	4140/4142	
		B/O	20NR-71	1	STOP PIN	S.S.	Ø1/8 X 1 (MCMMASTER-CARR #98380A475)
			20NR-72	1	LIGHT RELEASE PIVOT BUSHING	4140/4142	
			20NR-73	2	STIFFENER	4140/4142	
		B/O	20NR-74	2	BOLT	STEEL	5/8-18 X 5-1/2 (MCMMASTER-CARR #91247A449)
		B/O	20NR-104	2	RAIL FUNNEL BOLTS	STEEL	1/2-20 X 2-1/4 (MCMMASTER-CARR #91257A749)
		B/O	20NR-112	2	BOLT	STEEL	1/2-20 X 5-1/2 (MCMMASTER-CARR #91257A758)
	X		20NR-117	1	WIRE ASSEMBLY		
	1	B/O	EL314-SJTOW		ELECTRICAL WIRE 3/14 SJTOW		(TEXCAN 314-SJTOW)
	2	B/O	32448		16-14 AWG KNIFE CONNECTOR		(ALLIED ELECTRONICS #32448)
	1	B/O	EL-PLUG-M		MALE PLUG	PE High Density	(MCMMASTER-CARR #7216K5)
	1	B/O			HEAT SHRINK TUBE	RUBBER	(MCMMASTER-CARR #2595K22)
			600.1309	1	LABEL 	ALUMINUM	
			600.1309-A	1	LABEL 	ALUMINUM	
		B/O	600.1325	1	SOLENOID WARNING STICKER 	VINYL	3/4 X 3 (SIGNS NOW)
		B/O	188-FPSS-1/4 20-3/8	2	SET SCREW	S.S.	1/4-20 (MCMMASTER-CARR #92313A535)
		B/O	188-FPSS-1032-1/4	2	SET SCREW	S.S.	10-32 X 1/4 (MCMMASTER-CARR #94355A330)
		B/O	AN4-23A	3	BOLT	STEEL	1/4-28 X 2.41
		B/O	AN6-27A	1	AN6 BOLT	STEEL	3/8-24 X 2.953
		B/O	AN960-416	3	WASHER	STEEL	Ø1/4
		B/O	AN960-416L	2	SOLENOID WASHER	STEEL	Ø1/4
		B/O	AN960-616	2	AN-6 WASHER	STEEL	Ø3/8
		B/O	AN960-816	7	WASHER	STEEL	Ø1/2
		B/O	MS21044N6	1	AN6 NUT	STEEL	3/8-24
		B/O	MS21083N4	2	NYLOCK NUT	STEEL	1/4-28 LOW PROFILE
	ASSY -117						





UNDER REVIEW
ECR: HB ECR 233

NOTES:

 FOR REBUILD ONLY.

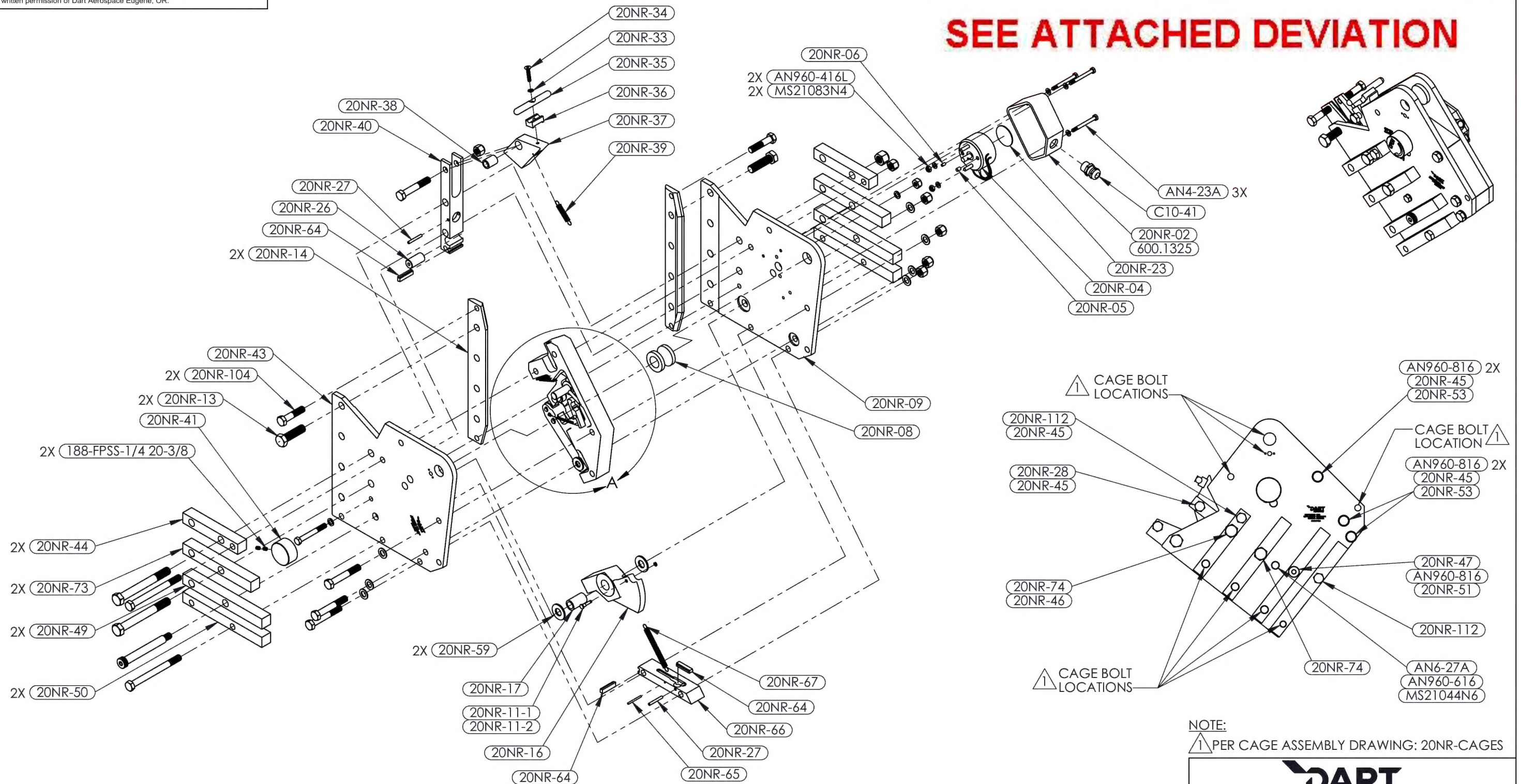
 FOR CUSTOMER REBUILD ONLY.

			
TITLE 20NR NUBBINS RECEIVER			
DWG NO. 20NR			REV 2
MAT'L UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES .XXX ± .005 FRACTIONS ± 1/8 .XX ± .01 ANGLES ± 5° .X ± .1		DRAWN BY: CANAM APPROVED  TREAT FINISH SPEC	
1. BREAK ALL SHARP EDGES .015 x 45° OR .015R 2. DIMENSIONAL LIMITS APPLY AFTER PLATING		USED ON MODEL	
SCALE 1:8	DATE 12/1/1995	SHEET 1 OF 4	

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REVISIONS					
REV	ECR	DESCRIPTION	DATE	INITIAL	APPROVED

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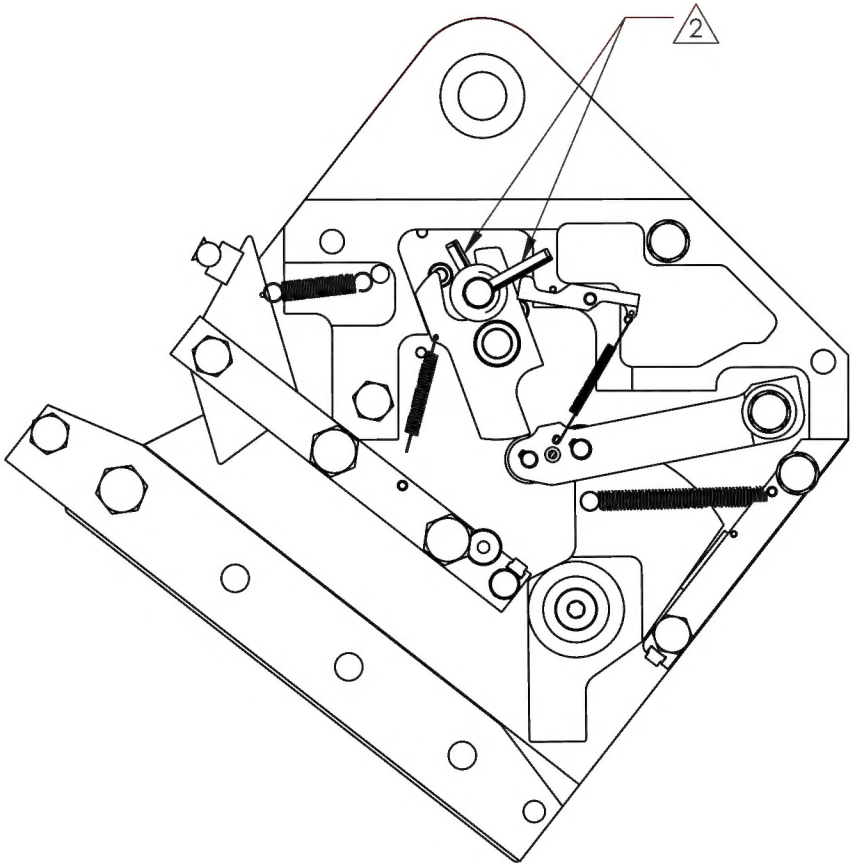
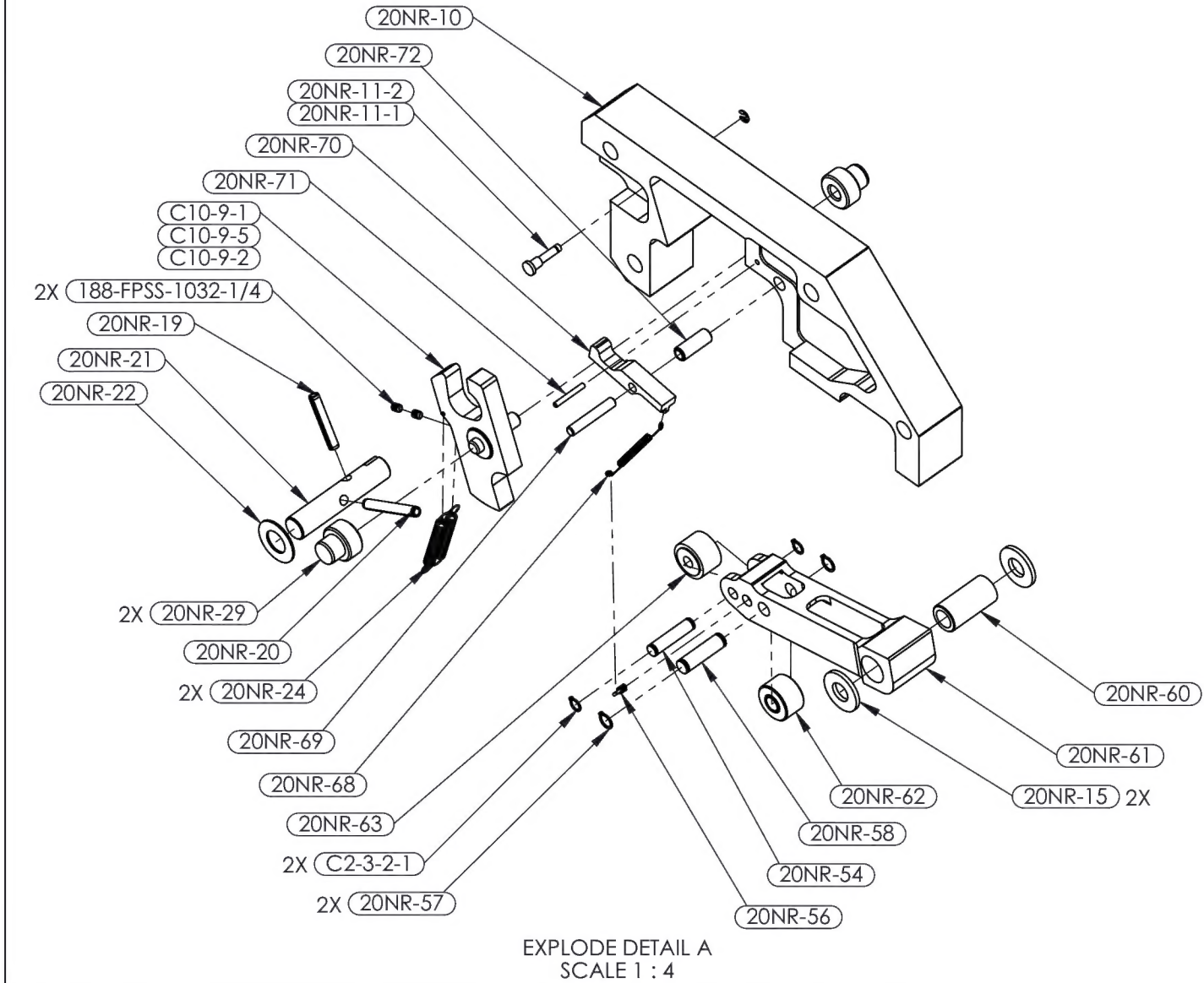
UNDER REVIEW
ECR: HB ECR 233

NOTE:
1 PER CAGE ASSEMBLY DRAWING: 20NR-CAGES

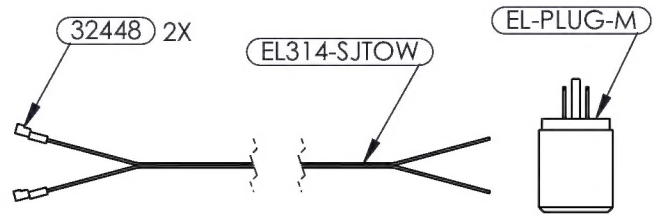
DART AEROSPACE	
TITLE 20NR NUBBINS RECEIVER	
DWG NO. 20NR	REV 2
MAT'L UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES .XXX ± .005 .XX ± .01 .X ± .1 1. BREAK ALL SHARP EDGES .015 x 45° OR .015R 2. DIMENSIONAL LIMITS APPLY AFTER PLATING	DRAWN BY: CANAM APPROVED: <i>D Weil</i> TREAT FINISH SPEC USED ON MODEL
SCALE 1:8	DATE 12/1/1995
SHEET 2 OF 4	

REVISIONS			DATE	INITIAL	APPROVED
REV	ECR	DESCRIPTION			

SEE ATTACHED DEVIATION




COVER REMOVED TO SHOW INTERNAL DETAIL



- NOTES:
1. WHEN INSTALING TO SOLENOID USE 2 SECTIONS OF HEATSHRINK TO SEAL CONNECTIONS.
 2. PLUG INCLUDED LOOSE IN KIT.

20NR-117
WIRE ASSEMBLY
SCALE 1 : 4

NOTE:
2 20NR-19 AND 20NR-20 PRESSED THRU 20NR-21 FLUSH TO SURFACE.

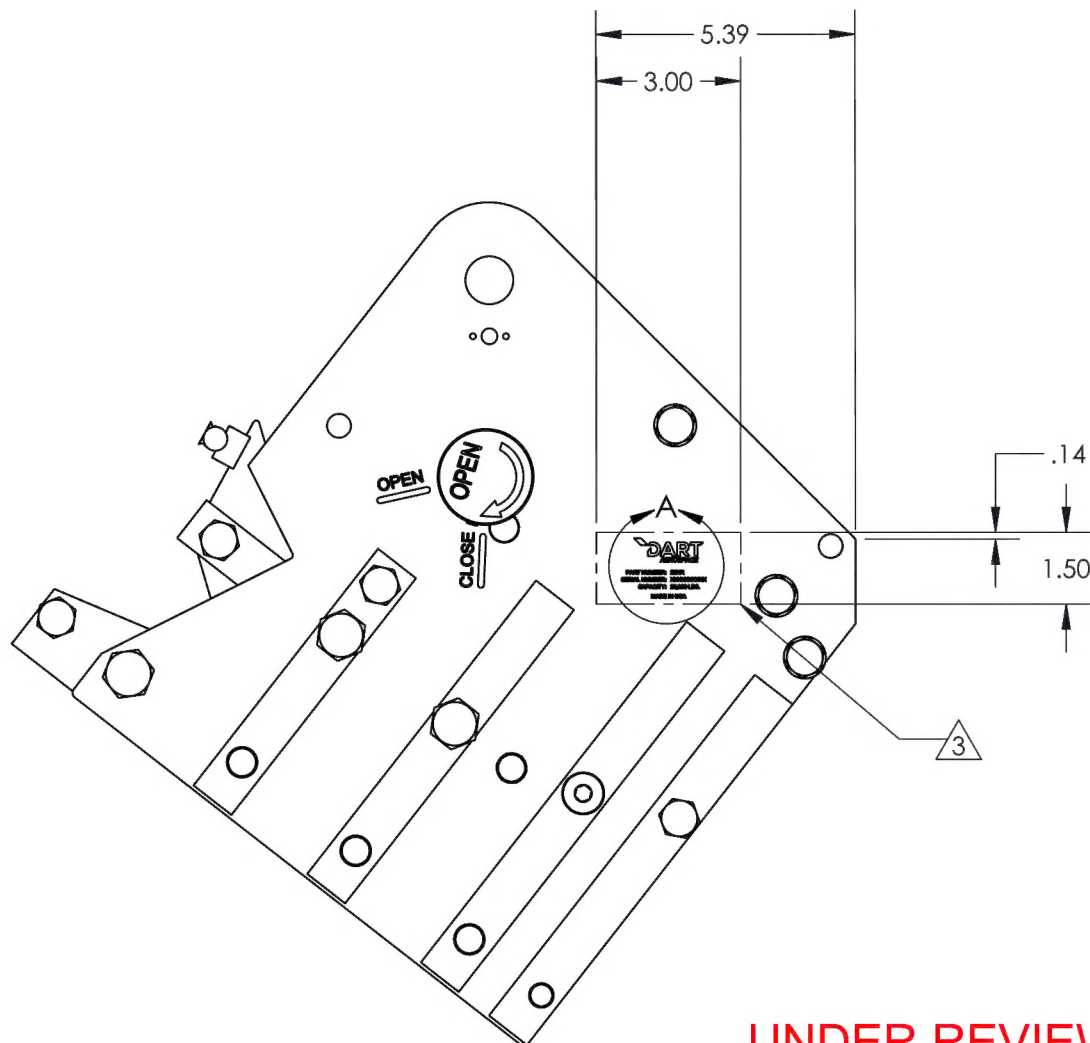
			
TITLE 20NR NUBBINS RECEIVER			
DWG NO. 20NR		REV 2	
MAT'L UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES .XXX ± .005 FRACTIONS ± 1/8 .XX ± .01 ANGLES ± 5° .X ± .1		DRAWN BY: CANAM APPROVED: <i>D Weil</i> TREAT FINISH SPEC USED ON MODEL	
1. BREAK ALL SHARP EDGES .015 x 45° OR .015R			
2. DIMENSIONAL LIMITS APPLY AFTER PLATING			
SCALE 1:4	DATE 12/1/1995	SHEET 3 OF 4	

UNDER REVIEW
ECR: HB ECR 233

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REVISIONS					
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SEE ATTACHED DEVIATION



DETAIL A
SCALE 1 : 1

NOTE:

3 LASER ENGRAVE DART LOGO, P/N, S/N, CAPACITY, "MADE IN USA," WITHIN BOUNDARY.

DART AEROSPACE	
TITLE 20NR NUBBINS RECEIVER	
DWG NO. 20NR	REV 2
MAT'L	DRAWN BY: CANAM
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	APPROVED <i>D Weil</i>
.XXX ± .005 FRACTIONS ± 1/8	HEAT TREAT
.XX ± .01 ANGLES ± 5°	FINISH
.X ± .1	SPEC
1. BREAK ALL SHARP EDGES .015 x 45° OR .015R	USED ON MODEL
2. DIMENSIONAL LIMITS APPLY AFTER PLATING	
SCALE 1:4	DATE 12/1/1995
SHEET 4 OF 4	

UNDER REVIEW

ECR: HB ECR 233

Entered: _____ Date: _____



WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. <u>20NR</u>	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/>	DEPARTMENT/PROCESS <div style="display: flex; justify-content: space-between;"> <div> Skid-tube <input type="checkbox"/> Machining <input type="checkbox"/> Large Fab <input type="checkbox"/> </div> <div> Cross tube <input type="checkbox"/> Small Fab <input type="checkbox"/> Finishing <input type="checkbox"/> </div> <div> Eng. (Non-AW) <input type="checkbox"/> Prod. Eng. Coord. <input type="checkbox"/> Rec/Store/Packaging <input type="checkbox"/> </div> <div> Engineering <input type="checkbox"/> Water Jet <input type="checkbox"/> Supplier <input type="checkbox"/> Quality <input type="checkbox"/> </div> </div>			
Date : <u>2019-05-16</u>	Sequence #:	QTY Affected :		MRB (QSI042) 	
Description Work Order Deviation		Disposition		Completed By <hr/> Lead hand / Supervisor <hr/> QC / QA Coordinator	
- ITEM 20NR-59 IS TOO THIN - ITEM 20NR-15 IS TOO THIN - ITEM 20NR-47 SHOULDER BOLT DON'T FIT NICELY ON SURFACE OF ITEM 20NR-49		- NEED TO ADD MCM# 3088A935 SHIMS TO 20NR-59 - NEED TO ADD MCM# 3088A934 SHIMS TO 20NR-15 - ITEM 20NR-47 SHOULDER LENGTH NEED TO BE MACHINED ACCORDING -49 THICKNESS TOLERANCES NEED TO ADD MCM# 91124A101 SHIM			
Root Cause <div style="display: flex; flex-direction: column;"> <div>Operator <input type="checkbox"/></div> <div>Manufacturing Process <input type="checkbox"/></div> <div>Equip/Tooling <input type="checkbox"/></div> <div>Handling/Presservation <input type="checkbox"/></div> <div>Material <input type="checkbox"/></div> <div>Product Improvement <input type="checkbox"/></div> <div>Process Improvement <input type="checkbox"/></div> <div>Human Factors <input type="checkbox"/></div> </div>		FAULT CATEGORY <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Bending <input type="checkbox"/> Crushing <input type="checkbox"/> Cracks <input type="checkbox"/> Crimp/Kink/Ripple/Wave/Twist <input type="checkbox"/> Marks/Chatter <input type="checkbox"/> Mislabeled </div> <div style="width: 50%;"> <input type="checkbox"/> Contamination <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Incomplete/Unclear Instructions <input type="checkbox"/> Drill Holes <input type="checkbox"/> Fit/Function </div> <div style="width: 50%;"> <input type="checkbox"/> Power Loss/Surge <input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain Direction <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Off-set/Set-up </div> <div style="width: 50%;"> <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Outside Tolerance <input type="checkbox"/> Drawing <input type="checkbox"/> Finish <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Misread </div> </div>			
		Other/Details: <div style="text-align: right; color: red; font-weight: bold; margin-top: 20px;"> UNDER REVIEW ECR: <u>HB ECR 233</u> </div>			

Entered: _____ Date: _____



WORK ORDER NON-CONFORMANCE / ROUTE UPDATE

NCR No. _____

Route update only ☐

Job: _____ Part No. <u>20NR REV 2</u>	DISPOSITION Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/>	DEPARTMENT/PROCESS <div style="display: flex; justify-content: space-between;"> <div> Skid-tube <input type="checkbox"/> Machining <input type="checkbox"/> Large Fab <input type="checkbox"/> </div> <div> Cross tube <input type="checkbox"/> Small Fab <input type="checkbox"/> Finishing <input type="checkbox"/> </div> <div> Eng. (Non-AW) <input type="checkbox"/> Prod. Eng. Coord. <input type="checkbox"/> Rec/Store/Packaging <input type="checkbox"/> </div> <div> Engineering <input type="checkbox"/> Water Jet <input type="checkbox"/> Supplier <input type="checkbox"/> Quality <input type="checkbox"/> </div> </div>			
Date : <u>2019-05-21</u>	Sequence #:	QTY Affected :		MRB (QSI042) 	
Description Work Order Deviation		Disposition		Completed By	
ITEM 20NR-34 MCMaster#91253A544 CHANGED FOR MCMaster#91263A178		THIS DEVIATION IS ACCEPTABLE TO USE AS IS FIT, FORM AND FUNCTION WILL BE AS ORIGINALLY INTENDED		Lead hand / Supervisor QC / QA Coordinator	
Root Cause <div style="display: flex; flex-direction: column; align-items: flex-start;"> <div>Operator <input type="checkbox"/></div> <div>Manufacturing Process <input type="checkbox"/></div> <div>Equip/Tooling <input type="checkbox"/></div> <div>Handling/Presservation <input type="checkbox"/></div> <div>Material <input checked="" type="checkbox"/></div> <div>Product Improvement <input type="checkbox"/></div> <div>Process Improvement <input type="checkbox"/></div> <div>Human Factors <input type="checkbox"/></div> </div>		FAULT CATEGORY <div style="display: flex; flex-wrap: wrap;"> <div style="width: 50%;"> <input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Bending <input type="checkbox"/> Crushing <input type="checkbox"/> Cracks <input type="checkbox"/> Crimp/Kink/Ripple/Wave/Twist <input type="checkbox"/> Marks/Chatter <input type="checkbox"/> Mislabeled </div> <div style="width: 50%;"> <input type="checkbox"/> Contamination <input type="checkbox"/> Misaligned/off center <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damage/Defect <input type="checkbox"/> Incomplete/Unclear Instructions <input type="checkbox"/> Drill Holes <input type="checkbox"/> Fit/Function </div> <div style="width: 50%;"> <input type="checkbox"/> Power Loss/Surge <input type="checkbox"/> Folio/Program <input type="checkbox"/> Grain Direction <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Off-set/Set-up </div> <div style="width: 50%;"> <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Outside Tolerance <input type="checkbox"/> Drawing <input type="checkbox"/> Finish <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Misread </div> </div>			
Other/Details:		<div style="color: red; font-weight: bold; font-size: 1.2em;"> UNDER REVIEW ECR: <u>HB ECR 233</u> </div>			